

### ABSTRACT

A relaxation oscillator for a transponder capable of measuring one or more parameters (e.g., temperature, pressure) in an object and transmitting a data stream to an external reader/interrogator. The transponder typically operates in a passive mode, deriving its power from an RF interrogation signal received by an antenna system, but can also operate in a battery-powered active mode. The transponder includes memory for storing measurements, calibration data, programmable trim settings, transponder ID and the like.

Measurement readings comprise counting oscillations of a measurement signal during a fixed time window. The measurement signal is generated by a relaxation oscillator driven by the alternating charging and discharging of measurement capacitors, wherein the capacitor charging rate is a function of current, and of capacitance. By using a mirrored measurement current to discharge the measurement capacitors, the discharge rate is made approximately equal to the charge rate. The measurement current can be scaled according to programmed trim settings to independently optimize readings for the different measured parameters.